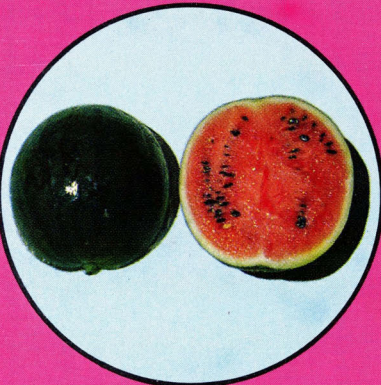


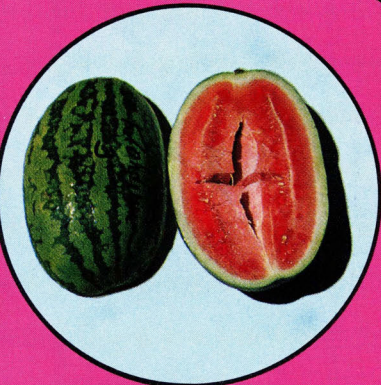
Watermelon Trials In Hawaii

R. W. Hartmann

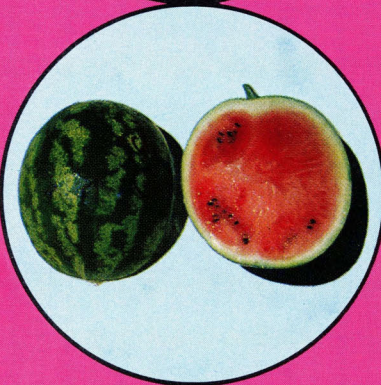
Black Seeded Chilean



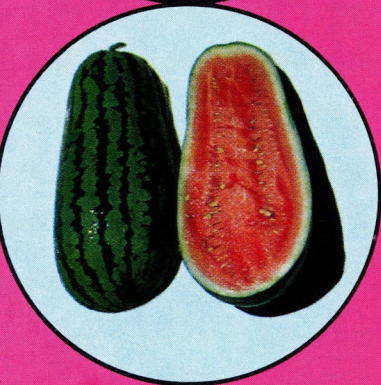
Klondike



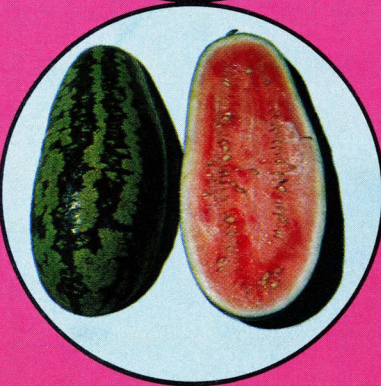
Crimson Sweet



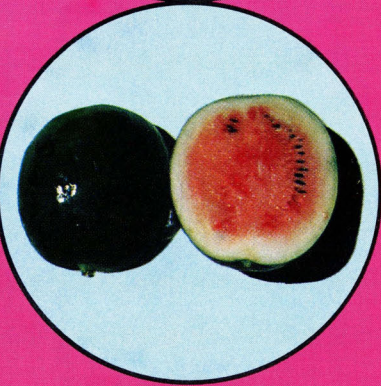
Carrisonian



Fairfax



Summit



WATERMELON TRIALS IN HAWAII

*Richard W. Hartmann**

'Black-Seeded Chilean' (cover, upper left), a small, high-quality watermelon with dark-red flesh, black seeds, and a thin rind, has been the most popular cultivar (variety) in Hawaii for many years. Since it is not resistant to Fusarium wilt, some growers attempt to combat this disease by grafting the watermelons onto resistant gourd rootstocks, a method which is not too successful because the fungus penetrates the watermelon vines anyway, shortly after they start to vine and touch the ground. Consequently, watermelon trials were planted in 1964, 1965, and 1966 for the purpose of testing Fusarium-resistant cultivars under Hawaiian conditions.

A total of 16 Fusarium resistant cultivars and 'Black-Seeded Chilean' were included in the trials, but only six were in all three trials. The 1964 trial was at the Waimanalo Experimental Farm, and the 1965 and 1966 trials were at the Poamoho Experimental Farm, both on Oahu. Eleven cultivars in three replications were included in each trial.

A heavy infestation of Fusarium wilt and watermelon mosaic started at one end of the field in 1964 and severely decreased the production from the earliest infested plots. Similar damage not correlated with varietal differences was encountered in 1965 from incomplete fumigation for root-knot nematodes. The 1966 trial was in a field not previously used for vegetables and no serious disease problems were found. Number, weight, quality, and rind thickness were measured at each harvest. The measure of quality used was percentage of soluble solids determined with a hand refractometer from two melons from each replication. Harvesting was continued as long as the

*Dr. Richard W. Hartmann is Assistant Horticulturist at the Hawaii Agricultural Experiment Station, College of Tropical Agriculture, University of Hawaii.

vines kept producing melons, four weeks in 1964, four and one-half weeks in 1965, and six weeks in 1966. In 1966 the vines were so vigorous that some started producing a second crop after the first was harvested.

The cultivars included in the trials were as follows

1. **'Blacklee'**—1964 trial only; long, dark-green melon; averaged 18.7 pounds; rind $\frac{3}{4}$ – $\frac{7}{8}$ inch; produced few melons; ranked last in soluble solids.

2. **'Black-Seeded Chilean'** (cover, upper left)—all trials; round, dark-green melon with faint stripe; averaged 10.8, 12.0, 11.1 pounds; rind $\frac{3}{8}$ inch; produced large number of high-quality melons.

3. **'Calhoun Sweet'**—1964 trial only; round, medium-green melon; averaged 17.3 pounds; rind 1 inch; production good; quality low.

4. **'Charleston Gray'**—all trials; long, gray melon; averaged 20.4, 19.5, 14.8 pounds; rind $\frac{1}{2}$ – $\frac{5}{8}$ inch; production good; quality disappointingly low in comparison with its performance elsewhere.

5. **'Crimson Sweet'** (cover, center left)—1965, 1966 trials only; round, striped melon; averaged 15.7, 13.1 pounds; rind $\frac{1}{2}$ inch; quality as high as or higher than 'Black-Seeded Chilean,' but production somewhat lower.

6. **'Criss-Cross'**—1965 trial only; round, striped melon; averaged 20.5 pounds; rind $\frac{5}{8}$ inch; quality was very low.

7. **'Dixie Queen'**—1966 trial only; round to oblong, striped melon; averaged 17.6 pounds; rind 1 inch; slow to mature; quality very low.

8. **'Fairfax'** (cover, lower left)—all trials; long, striped, white-seeded melon; averaged 20.6, 18.5, 17.1 pounds; rind $\frac{1}{2}$ – $\frac{5}{8}$ inch; production good; quality generally good.

9. **'Garrisonian'** (cover, center right)—all trials; long, striped, white-seeded melon; averaged 25.2, 25.2, 16.3 pounds; rind $\frac{3}{4}$ inch; production good; quality usually very good.

10. **'Hope Diamond'**—1964 trial only; round, dark-green melon; averaged 21.3 pounds; rind 1 inch; production poor; quality fair.

11. **'Jubilee'**—1966 trial only; long, striped melon, tendency to be gourd-shaped; averaged 14.5 pounds; rind 1–1 $\frac{1}{4}$ inch; production fair; quality poor.

12. **'Klondike'** (cover, upper right)—all trials; long, striped, somewhat blocky melon; averaged 20.8, 21.1, 20.0 pounds; rind $\frac{3}{4}$ inch; consistently very high quality, but has tendency toward hollowness and is very late in starting to bear.

13. **'New White Hope'**—1965, 1966 trials only; long, gray melon; averaged 20.2, 13.0 pounds; rind $\frac{1}{2}$ – $\frac{5}{8}$ inch; production good; quality only fair.

14. **'Princeton'**—1964, 1965 trials only; long, dark-green melon; averaged 23.8, 19.8 pounds; rind $\frac{3}{8}$ – $\frac{1}{2}$ inch; production average; quality poor.

15. **'Shipper'**—1964 trial only; round, dark-green melon; averaged 20.3 pounds; rind $\frac{5}{8}$ inch; production fair; quality poor.

16. **'Summit'** (cover, lower right)—all trials; round, dark-green melon; averaged 23.2, 25.4, 17.0 pounds; rind $\frac{3}{4}$ –1 inch; production high; quality usually high.

17. **'Sunny Boy'**—1966 trial only; round, light-green melon; averaged 9.5 pounds; rind $\frac{1}{2}$ inch; production high; quality good.

In Table 1 the six cultivars pictured on the cover are ranked according to percentages of soluble solids (quality). The only cultivar superior to 'Black-Seeded Chilean' was 'Klondike.' However, 'Klondike' cannot be recommended as a replacement for 'Black-Seeded Chilean' because it has the disadvantages of too large a size for local markets, late fruiting, and hollow-ness (see cover photograph).

Of the other cultivars equal in quality to 'Black-Seeded Chilean,' only 'Crimson Sweet' was in the same size class. This cultivar produced generally high-quality melons, but the total production was lower than 'Black-Seeded Chilean.' This is more apparent when figures for only 1965 and 1966 are compared. In these two years 'Black-Seeded Chilean' produced a total of 161 melons weighing 1,843.8 pounds whereas 'Crimson Sweet' produced only 89 melons weighing 1,252.4 pounds. 'Crimson Sweet' was not grown in 1964 when production was low for all cultivars.

'Sunny Boy,' grown only in 1966, may be a good cultivar to try. It produced 83 melons for a total weight of 789.3 pounds compared with 99 melons and 1,096.7 pounds for 'Black-Seeded Chilean' in that year. Average size was 9.5 pounds and percent of soluble solids was 9.6.

The objective of these trials was to find a *Fusarium*-resistant cultivar that could replace the susceptible 'Black-Seeded Chilean,' but no differences in *Fusarium* susceptibility were apparent. All cultivars seemed to be uniformly and completely susceptible to the strain in the field at Waimanalo in 1964. At Poamoho in 1965, although infestation was not general, *Fusarium*

TABLE 1. Average performance of six best cultivars of watermelon in three trials at Waimanalo and Poamoho, 1964–1966.

Cultivar	Percent of soluble solids ¹	Ave. weight in pounds	No. melons/trial ²	Yield tons/acre ²
Klondike	11.1	20.63	32.7	7.3
Crimson Sweet ³	10.1	14.40	35.3 ⁴	5.5 ⁴
Garrisonian	10.1	22.23	36.7	8.7
Summit	10.1	21.90	49.0	11.5
Black-Seeded Chilean	9.9	11.30	62.7	7.6
Fairfax	9.6	18.73	39.0	7.9

¹'Klondike' is significantly better than other cultivars. Other differences are not significant.

²Differences not significant.

³Two trials only.

⁴Adjusted for lack of 1964 data.

was isolated from dying vines of both resistant cultivars and 'Black-Seeded Chilean.' No *Fusarium* was found on any cultivars in 1966. It has not been determined whether the lack of resistance noted in these trials is due to a different strain of *Fusarium* or a possible interaction with other pathogens.

No cultivar included in these trials performed sufficiently well to be recommended as a replacement for 'Black-Seeded Chilean.' 'Klondike' was superior in quality but had the disadvantages of late bearing, large size, and hollowness. Although 'Crimson Sweet' was equal in quality and size to 'Black-Seeded Chilean,' its yield was considerably lower. Its *Fusarium* resistance was not a factor in these trials and would not be sufficient reason to replace the standard cultivar. 'Sunny Boy' also was equal in quality and size to 'Black-Seeded Chilean' and yielded nearly as well, but it was only included in one trial and may perform differently in another year or another field. 'Black-Seeded Chilean' best filled the requirements of quality, size, and productivity.

**UNIVERSITY OF HAWAII
COLLEGE OF TROPICAL AGRICULTURE
HAWAII AGRICULTURAL EXPERIMENT STATION
HONOLULU, HAWAII**

THOMAS H. HAMILTON

President of the University

C. PEAIRS WILSON

Dean of the College and
Director of the Experiment Station

G. DONALD SHERMAN

Associate Director of the Experiment Station